

# Ceramics Notes

**Ceramics** is the art of making pottery or working with clay.

**Clay** is naturally formed by the erosion or breaking down of the earth's surface. Found worldwide it is primarily made up of hydrated silicates of alumina. This is why raw clay can be found in creek beds and wet areas. Clay is plastic in nature and can easily be molded into forms. Blended clays are known as clay bodies.

In choosing a clay body, there are three basic considerations:  
***Firing Temperature, Texture, and Color & Glaze Response.***

## **Firing Temperature**

The basic factor in choosing a clay body is your kiln. Determine what temperature you can fire at and then choose a clay body that will mature at that temperature. There are three basic temperature ranges for clay bodies:

Earthenware Clay bodies —Cone 06–3 1850-2000°F/1000-1160°C

Mid Range Clay bodies —Cone 4–7 2160–2260°F/1160–1225°C

High Fire Clay bodies —Cone 6–10 2200–2400°F/1200–1300°C

## **Texture**

Texture refers to the “feel” or “tooth” of the clay, which is achieved by the addition of coarse ground fireclays, sand, or grog. Potter’s usually prefer their wheel throwing clay to be smoother than their sculpture clay. This is simply a matter of preference, as wheel and sculpture clay can be used interchangeably by many potters.

## **Color & Glaze Response**

Terra Cotta has a beautiful natural reddish-brown color, which is often times left unglazed. Other clays, such as porcelain, can be colored by adding oxides or stains. Every colored clay will cause a different glaze response. If you are looking for the truest color response from a glaze, choose a white firing clay.

## **TYPES OF CLAYBODIES:**

Clay bodies are made up of many different kinds of clay, however some of the most common clay bodies are:

**Earthenware:** Low fire clay that is usually reddish brown, gray, or white in color. It works well with throwing on the wheel and hand building because it is smooth and porous. This is what we will be using during ceramics.

**Stoneware:** Higher firing clay than Earthenware, in the middle range, porous clay that can be used for hand building and throwing. This is usually groggier than Earthenware clay. It is a little more expensive and glazes are harder to control. Some stoneware clay bodies as well as glazes work better fired in a gas kiln to reach higher temperatures.

**Porcelain:** Middle range to high range of firing, smooth in texture, and white in color. This type of clay works better with wheel thrown or casted from a mold, but because the clay body is so thin it is very hard to work with on the wheel. This clay body is also much more expensive.

**Fire Clay:** Highest firing clay commonly used for insulating brick, hard firebrick, and kiln furniture. Firing of this clay takes a special gas kiln.

## **STAGES OF CLAY:**

Before you can have a finished clay project, the body of clay must go through the following 5 stages slowly to mature the clay.

**STAGE #1 - GREENWARE:** Clay that has not been fired. In this stage clay can always be melted down and re-worked for usable clay. In the greenware stage as clay begins to dry out it goes through 3 stages before the clay body can be fired.

**Wet Clay:** In this stage clay can be easily manipulated and formed.

**Leatherhard:** In this stage the clay begins to dry out, leaving the body flexible and tough. As the clay dries out, you will notice the color turn lighter. You can't easily smooth pieces of clay together, however you may use the slip and score method. It may be easier to work with larger pieces once they have dried out a little.

**Bone Dry:** In this stage, clay is much more fragile as the moisture is drawn out of the clay body. Piece can easily break, especially if not properly attached. You will not be able to attach pieces back together once the piece is completely dried out. When the clay piece feels room temperature it is ready for the first fire.

Once your piece is bone dry follow this procedure:

Sand or smooth your piece as well as sign or initial it. Place it on the table by the kiln to be fired.



**STAGE #2 - BISQUE FIRE:** The first fire your piece will go through, roughly about 1900 degrees at the hottest point it will mature and harden the clay body. This fire takes roughly 24 hours from start to finish as it slowly heats and cools your piece.

**STAGE #3 - BISQUE WARE:** Ware that has been bisque fired and ready to be painted or glazed. Once your piece has been fired, paint it with acrylic paint to be finished or glaze it to be fire again. Acrylic painted ware does not get re-fired, the piece is done once the paint dries. Be sure to follow all glazing and painting procedures.

**STAGE #4 - GLAZE FIRE:** The second and last fire your glazed piece will need to go through. This fire is a little cooler, about 1600 degrees yet still hot enough to melt and fuse the glass silicates in the glaze. This fire also takes about 2 days before the ware is cool enough to safely unload the kiln.

**STAGE #5 - GLAZE WARE:** Fired glazed ware.

## **PARTS OF A POT:**

**Lip / Rim:** The top of your piece, sometimes distinct and different from the rest of the piece.

**Belly:** The main body of the piece, which could be used to hold something.

**Foot:** The base of the piece, usually a ring like base on a wheel thrown piece formed by tooling excess clay.

## **OTHER TOOLS AND SUPPLIES**

### **Kiln:**

Without a kiln, pottery is hardly pottery. A kiln bakes or "fires" pottery at very high temperatures to harden the clay and melt the glaze onto the surface of the pottery. Kilns vary greatly in size, and several types are available. Some kilns are intended to fire only very small jewelry pieces. These kilns are only several inches large and are almost always electrically operated. Other kilns are as large as entire rooms and used for industrial ceramic producers. These huge kilns are operated electrically, with fire or with gas. Occasionally, people will fashion an outdoor kiln.

These are inexpensive kilns that are placed over a fire and used to create interesting patterning caused by the unharnessed fire.

Other primitive firing methods such as pit firing are still in use today for more decorative pieces.